DO MACROECONOMIC FACTORS SIGNIFICANTLY AFFECT ECONOMIC GROWTH? EVIDENCE FROM GHANA

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ABSTRACT

Macroeconomics examines the entire economy using various indicators such as investment, exchange rate, unemployment rate, and trade. These indicators contribute either positively or negatively to economic growth. Following Ghana's economic reforms in 1983, its economy underwent significant transformations, impacting it in various ways. This study investigated selected macroeconomic variables (external debt, FDI, inflation, real effective exchange rate, and trade openness) that influence Ghana's economic growth. The study analyzed time series data from the World Bank spanning from 1991 to 2021 using econometric methods, including the Johansen cointegration, Ordinary Least Squares (OLS), and distributed lagged model. The cointegration results revealed a long-run relationship between the variables. The OLS findings indicated that external debt, FDI, and trade openness positively impacted economic growth, while inflation and unemployment rates had negative effects, with GDP serving as a proxy for economic growth. Additionally, the results showed that the real exchange rate had no significant effect on Ghana's economy. Conversely, findings from the distributed lagged model provided evidence that inflation, external debt, and FDI impact spread over a certain period. Based on these findings, the study recommends that the Ghanaian government invest external loans in sectors capable of boosting economic growth and provide investment incentives to attract more investors.

1. INTRODUCTION

Several factors contribute to the economic development of a country. These indicators can be classified as macroeconomic elements. Major macroeconomic indicators such as gross domestic product (GDP), GDP per capita, inflation, unemployment rate, trade openness (trade ratio to GDP), net investment inflows, and public debt are considered when measuring the economic growth of an economy. Over the past centuries, many economies have implemented strong macroeconomic policies that led to economic growth, and different channels through which this goal is achieved have been carried out by many nations (Evans, Samuel & Prince, 2021). The effectiveness of macroeconomic policy implementations is often seen as successful when indicators like GDP, investment inflows (FDI), GDP per capita, trade balance (trade surplus), and human development index (HDI) expand. However, factors like high inflation, unemployment, and public debt are used to determine non-performing economies. Conversely, economic indicators such as debt, inflation, trade, investment, and unemployment are seasonally adjusted variables and are inevitable in all economies (Yeboah, 2022). The impact of any of these variables influences the welfare and standard of living of the people. For instance, high inflation and unemployment rates reduce people's purchasing power and income.

The interdependence sees the globalization of economic actors across different economies (Hobbs, Dimitrios & Mostafa 2021); any economic shock in the most advanced economies affects the supply chain and the circular economy, eventually affecting developing and least-developed countries. Theories and models of economic growth underscore the diverse ways in which present economic activities can influence future economic developments and identify potential sources of long-term economic growth (Boldeanu & Constantinescu, 2015). It's worth noting that economic growth theories have evolved over time in response to changing economic dynamics. The key to solving the unemployment problem and turning economic development into rising standards of living in industrialized nations, which have mostly mastered their macroeconomic strategies, lies in small-scale change (Blanchard, Jaumotte & Loungani, 2014). If change efforts in developing countries continue to focus on macroeconomic transformation in the style of the International Monetary Fund system (IMF), economies may see a continued trend of unhappiness (Siyal et al., 2016).

Over the past years, Ghana's economic activities have depended on foreign direct investment (FDI) inflows, external debt, and domestic debt. The sum of external and domestic debt makes up the aggregate public debt of a country. The United Nations Conference on Trade and Development (UNCTAD) investment

report in 2022 indicated that the FDI inflow in Ghana was 2.6 United States dollars ($USD), reflecting a 39% expansion from 2022. However, many empirical studies confirm that FDI in the Ghanaian economy has yielded a positive impact. According to Okwu, Oseni & Obiakor (2020), every economy's aggregate expenditure is influenced by investment, which also significantly affects growth by raising productivity and creating jobs. However, FDI can also support a nation's development efforts by enhancing the nation's total factor of productivity or by accumulating physical and human capital (Rodan, 1997). On the contrary, according to the World Bank, FDI is advantageous to the host country since it aids in market expansion, cost-cutting initiatives, and other tariff reductions. Additionally, it has been found that the quantitative effects of FDI on global employment are more restrained and significant in host developing countries than in most developed countries, particularly in production areas (UNCTAD, 1999).

As a result, the surge in Ghana's external debt has triggered numerous controversies over the years, causing widespread concern. The escalating GDP-to-debt ratio in the country has raised economic apprehensions, as highlighted by Agyapong and Bediabeng (2019). The capacity to utilize external debt for various investment-oriented projects, such as those related to infrastructure, power, or the agricultural sector, can be advantageous for a nation's development. Studies suggest that external debt can positively impact the socioeconomic development of a country when used judiciously. However, when employed excessively, it can have detrimental effects, as indicated by Shamim, Jawaid & Madiha (2017). However, indicators such as unemployment, inflation, trade openness, and real exchange rate also contribute to economic growth in Ghana's economy. This study considered these variables in assessing economic growth. This study investigated the impact of some macroeconomic indicators (external debt, FDI, inflation, unemployment rate, real exchange rate, and trade openness) on the economic advancement of Ghana. The study hypothesized that these selected variables positively or negatively affect economic growth. Conversely, the study is organized into the following: section one covers the introduction, section two is a literature review, section three is material and method, section four is results and discussions, and section five covers the conclusion.

2. LITERATURE REVIEW

Foreign direct investment has a lengthy, albeit major, history in Ghana. The involvement of the first international businesses can be traced back several centuries. More recently, in the 1970s, FDI was predominantly used in

manufacturing to replace imports. According to UNCTAD, annual inflows peaked at $68 million for approximately two years but were generally much lower. By the late 1970s, net outflows reached negative levels, and by the mid-1980s, they were hovering around $5 million. Ghana completed a largely successful transition from an administrative system of economic management to a market economy with the launch of the Economic Reform Programme (ERP) in 1983. Regardless of the time horizon, institutional quality has a positive and considerable impact on FDI (Yakubu, 2020). However, many studies have been conducted on FDI's impact on economic growth in Ghana and other parts of the globe, but they are considered in line with this study. According to Antwi et al. (2013), empirical studies on FDI's impact on economic growth in Ghana using ordinary least squares demonstrate a significant and positive association between foreign direct investment and economic growth. However, Evans, Frank & Rebecca (2017) found in their study that FDI and the other two control variables considerably impact Ghana's economic progress. According to the study, the rising trend in FDI inflows has also had a considerable positive impact on the nation's GDP. Conversely, Antwi and Zhao (2013) established a long-term equilibrium and causal connection between the dependent variable, FDI, and the two variables, GDP and GNI, that are being considered. The short-term effects of GDP and GNI volatility on FDI were found to be almost nonexistent. Additionally, Kulu, Mensah & Sena (2021) showed that the combination of foreign direct investment and a high-quality institutional index has a significantly beneficial impact on a nation's economic growth over the long and short terms in Ghana's economic growth. Consequently, the study findings of Benedict, Tutu & Salase (2021) support Ghana's FDI-led growth by showing that FDI has a favorable long-term causal influence on economic growth. Furthermore, the findings of Antwi et al. (2021) support Ghana's FDI-led growth by showing that FDI has a favorable long-term causal influence on economic growth.

Sub-Saharan African countries often have a development strategy that heavily depends on foreign funding from official and private sources. Unfortunately, this has led to the accumulation of external debt to an unsustainable level for several regional countries during the past few decades. According to the IMF, the stock of sub-Saharan Africa's external debt was roughly $18 billion in 1975; by 1995, it had increased to almost $220 billion. The portion of a country's debt owing to foreign creditors, such as commercial banks, international financial institutions, or governments, is known as its external debt. Nonetheless, the World Bank defines external debt as the overall gross amount of current liabilities that residents of an economy owe to nonresidents, which are slated for future principal and interest payments but are not contingent at any specific moment. In accordance

with Isaac, Tinashe & Mensah (2021) study on the influence of external debt on Ghana's economy, it revealed an adverse and statistically significant correlation between external debt and economic growth. Conversely, Hilton (2021) revealed that there is no unidirectional Granger causality running from public debt to GDP in the short run; there is one in the long run in Ghana. Consequently, Epaphra and Mesiet (2021) stated in their empirical findings that African nations must quickly implement effective and efficient external debt management methods that will favor on-time repayment since the burden of foreign debt and debt payments have been a notable cause of a lack of finances for public expenditures and growth. Furthermore, Lucy, Collins & Ernest (2016) analyzed the impact of public debt on Ghana's economic expansion. According to the study, Ghana's domestic and foreign debt negatively link the country's economic growth. Additionally, Senadza, Fiagbe & Quartey (2017) revealed that external debt negatively links to growth. It does not always mean that Sub-Saharan African nations should reduce their foreign borrowing to increase growth. Moreover, Fumey, Bekoe & Imoru (2022) employed the Autoregressive Distributed Lag (ARDL) model and discovered that the tax disincentive effect has a negative long- and short-term impact on the service of external debt in Ghana.

There is much ongoing discussion about the connection between trade openness and economic growth in the world's theoretical and empirical literature (Khobai, Kolisi & Moyo, 2018). Theoretical arguments show that even though trade openness increases economic efficiency, trade liberalization may harm nations due to market imperfections, technological variations, and endowments (Silajdzic & Mehic, 2018). Trade openness's impact on an economy may depend on the restrictions that still exist in some nations. However, Keho (2017) employed the Toda and Yamamoto Granger causality tests and the Autoregressive Distributed Lag limits to test for cointegration. The findings demonstrate that trade openness has favorable long- and short-term benefits on economic growth. Conversely, based on long-term empirical findings from Malefane and Odhiambo (2018), the study concludes that trade openness influences economic growth positively and substantially when the ratio of total trade to GDP is considered. On the contrary, evidence from a study on trade openness in African countries by Kinfack and Lumengo (2022) identifies a divergence between openness and growth in low-income economies. Conversely, for upper-income nations, the coefficients of trade indicators are positive and significant. Conversely, Umme, Munshi & Shamim (2012) studied the effect of trade openness in Bangladesh using the OLS method, and the findings showed that liberalization led to higher GDP growth. Sheng et al. (2019) results reveal that while trade openness negatively impacts economic growth when fixed capital formation is considered a mediating

factor and threshold, it tends to positively influence developing economies. Furthermore, Olufemi (2004) outcomes suggested that openness and growth have a one-way relationship, and this demonstrates that, depending on Nigeria's economic development level, a higher level of openness will be advantageous. Consequently, Elijah and Musa (2019) results indicated that trade openness has a detrimental effect on short-term and long-term economic growth.

The unemployment rate in Ghana has been a major challenge for the government over the years. The OECD defines unemployment as the status of individuals of working age who are not employed, available for work, and have actively sought employment. The labor market is conventionally perceived as transparent under the neoclassical framework, assuming flexible wages and perfect information. However, if this assumption is distorted due to wage rigidity caused by institutional factors, such as minimum wage laws, the labor market may not be transparent, resulting in classical involuntary unemployment (Baah-Boateng, 2013). Key measures of the state of an economy include the quantity and quality of available jobs, as determined by unemployment and joblessness rates, poverty incidence, and income inequality. Nonetheless, Shackleton (1985) states that when an individual is unable to secure employment while being willing to accept lower real pay or worse working conditions compared to similarly qualified individuals who are currently employed, it is considered involuntary unemployment. Baah-Boateng (2013) provides evidence supporting the claim that employment growth in Ghana lags behind economic growth due to the rapid expansion of sectors with low employment generation and the slow expansion of sectors with high labor absorption. Conversely, Sulemana, Anarfo & Doabil (2019) found in their study that there is an inverse relationship between unemployment and self-rated health among Ghanaians. Additionally, Adarkwa, Donkor & Kyei (2017) indicated that only the service sector, according to the study, significantly impacted Ghana's unemployment rate negatively.

However, the highest inflation rate in Ghana occurred in 1983, which was 122.87%, compared to 116.45% and 116.50% in 1997 and 1981, respectively. The high inflation rate was due to pressures on demand brought on by monetary and fiscal expansion. Ghana became one of the first emerging market economies and one of the first low-income nations to embrace inflation targeting when it did so legally in 2007 (Nchor & Darkwah, 2015). The post-Covid-19 period has shown that Ghana's inflation has risen to a double-digit 37.2% as of September 2022. Some studies have empirically captured the impact of inflation in Ghana. For instance, Olusola et al. (2022) indicated that inflation expectations harm consumer attitudes toward private consumption expenditure among consumers in extremely advantageous financial situations. Philip et al. (2015) found in their

study results of the Economic Recovery Program led to a 0.018% decrease in inflation. Additionally, Solomon, Kweku & Felicia (2014) found that inflation significantly impacted people's quality of life, forcing them to take out loans and put in extra hours at the office to make ends meet. It was also discovered that, because of the significant inflation in 2013, the population's standard of living declined the most. Kyereboah-Coleman (2012) found in their results that IT significantly affected the decline of the inflation series in recent years and significantly decreased the persistence of the inflation series in Ghana. Furthermore, Akingbade and Nicholas (2021) found in their study that Ghana's state debt has inflationary repercussions.

3. MATERIALS AND METHODS

The research employed both ordinary least squares (OLS) and distributed lagged models to examine the correlation between the independent variables and the dependent variable. This technique minimizes the sum of squared vertical distances between observed responses in the dataset and those predicted by the linear approximation. The OLS estimator is considered optimal among linear unbiased estimators when errors are homoscedastic and serially uncorrelated, and it remains consistent when regressors are exogenous without multicollinearity (Vaclav, 2014). In cases where errors have finite variances, OLS yields a minimum-variance, mean-unbiased estimate. Economic theory assumes a linear connection between the dependent variable and independent explanatory variables, accounting for arbitrary (unexplained) deviations, errors, and residuals. A distributed lag model is a dynamic model where the impact of a regressor on the dependent variable unfolds gradually over time rather than occurring suddenly (Vaclav, 2014). The values of the regressors in many economic models' regression equations have lagged values. For example, public investments like roads and highways require time. The size of an explanatory variable's coefficient, presented as a function of the lag, is provided by a lag distribution function (Vaclav, 2014). The easiest strategy to account for economic growth inertia is to incorporate both prior and present growth changes into the regression model. A distributed lag model is one in which an independent variable appears more than once at various temporal lags. However, this study investigated the impact of macroeconomic factors (unemployment, external debt, trade openness, real exchange rate, FDI inflows, and inflation) on the Ghanaian economy's economic advancement. Time series data required a different approach to analyze from an economic standpoint. The application of these methods is based on past literature from (Nketiah et al., 2020; Papi, 2019; Antwi et al., 2013; George, James &

Poku, 2013). Conversely, Søren (1988) cointegration test is used to investigate the long-run relationship between the variables towards economic growth. The cointegration test helps to understand the dynamics in the effect of series inter-dependencies over many periods and indicates whether the variables have a positive or negative impact on growth.

Data Source

The study utilized time series data with an annual frequency sourced from the World Bank covering the period from 1991 to 2021. Time series data was chosen due to its ability to capture the dynamics in the trend of the variables and their impact on economic growth over a specific period. The size of the observations was influenced by the aim to capture the post-economic effects of the implementation of the structural adjustment program. GDP data were computed using 2015 as the base year and measured in constant prices. Trade openness was calculated as the ratio of exports and imports of goods and services to GDP. All variables were converted into logarithm for analysis.

Model Framework

As Ghana's economy expands, it increasingly relies on imports, foreign direct investment (FDI), and external debt to fund its development projects. However, recent episodes of hyperinflation and high unemployment rates have sparked significant controversies regarding the economy's performance. In light of these developments, the study seeks to address the research question: "Are there significant relationships among the unemployment rate, external debt, trade openness, real exchange rate, FDI inflows, and inflation towards economic advancement in Ghana?" If such relationships exist, what impacts do they exert? To answer this question, a regression model is employed, as outlined in Equation 1, to examine the causal relationship between these variables.

$$lnGDP_t = \beta_0 + \beta_1 lnUnem_t + \beta_2 lnEtd_t + \beta_3 lnTop_t + \beta_4 lnReer_t + \beta_5 lnFDI_t + \beta_6 lnfl_t + \varepsilon_t \quad (1)$$

In the study, GDP represents the real gross domestic product, Unem represents the unemployment rate, Etd stands for external debt, Top indicates trade openness, Reer represents the real effective exchange rate, FDI stands for foreign direct investment inflows, and Infl denotes inflation. To further enrich the scope of the study, the distributed lagged model depicted in Equation 2 is employed to investigate the dynamics of some variables and how their past events influence the current trend.

$$lnGDP_t = \beta_0 + \beta_1 lnUnem_t + \beta_2 lnEtd_{t-1} + \beta_3 lnTop_t + \beta_4 lnFDI_{t-1} + \beta_5 lnfl_{t-1} + \varepsilon_t \quad (2)$$

The subscript t_{-1} attached to external debt, FDI inflows, and inflation indicate time, and 1 is one period lagged length of the variables. The aim of testing this hypothesis is to determine whether these variables' past events affect their present influence on economic growth in the Ghanaian economy. β_1, β_2, β_3, β_4, β_5, and β_6 are the regression coefficients, and ε_t represents the error term. The β_0 stands for the constant term obtained from the model.

4. RESULTS

Table 1 shows the variables' summary statistics, which indicate their mean, median, standard deviation, maximum and minimum values. The mean GDP value of 33.0 suggests the average economic output of the country, with a moderate standard deviation of 16.8 indicating variability in GDP among observations. The range from a minimum of 13.9 to a maximum of 66.2 reflects significant disparities in economic performance across different periods or regions. The mean unemployment rate of 6.15 represents the average proportion of the labor force that is unemployed, with a standard deviation of 1.77 indicating variability in unemployment rates over time or across different segments of the population. The range from 3.49% to 10.5% illustrates the extent of fluctuations in employment levels and potential challenges in maintaining consistent job opportunities. The mean external debt level of 11.4 suggests the average amount of debt owed by the country to foreign creditors, with a standard deviation of 8.17 indicating considerable variability in the country's indebtedness. The range from 3.69 to 31.3 reflects differences in borrowing practices and economic policies. The mean real effective exchange rate of 96.2 indicates the average value of the country's currency relative to a basket of foreign currencies, adjusted for inflation, with a standard deviation of 19.3 suggesting moderate variability in the exchange rate. The range from 67.1 to 144. reflects significant fluctuations in the country's currency value over time, potentially affecting import and export dynamics. The mean FDI value of 1.48 represents the average inflow of foreign investment into the country's economy, with a standard deviation of 1.46 indicating variability in the amount of FDI received. The range from 0.020 to 3.88 demonstrates the diversity in the scale of foreign investment, contributing to economic growth, technology transfer, and job creation. The mean inflation rate of 17.8 indicates the average annual increase in the general price level of goods and services, with a standard deviation of 11.9 suggesting moderate variability in inflation rates. The range from 0.410% to 59.5% highlights significant fluctuations in price levels, impacting consumers' purchasing power, savings, and investment decisions.

Table 1: Summary Statistics

Variable	Mean	Median	S.D.	Min	Max
GDP	33.0	27.3	16.8	13.9	66.2
Unemployment	6.15	5.62	1.77	3.49	10.5
External debt	11.4	7.23	8.17	3.69	31.3
Real effective exchange rate	96.2	94.2	19.3	67.1	144.
FDI	1.48	0.636	1.46	0.020	3.88
Inflation	17.8	14.8	11.9	0.410	59.5

Source: Authors calculations

Multicollinearity test

The collinearity test was conducted using the Belsley-Kuh-Welsch (BKW) test to examine whether certain variables can explain others. The variance inflation factor (VIF) was utilized in this test, with a range of 1 representing the lowest value and 10 as the maximum acceptable value. However, values exceeding 10 are deemed problematic. The collinearity test output is summarized in Table 2.

Table 2: Collinearity test

Variable	Variance Inflation Factor
Unemployment	2.665
External debt	3.536
Trade openness	2.712
Real effective exchange rate	4.261
FDI	3.045
Inflation	1.674

Source: Authors calculations

The outcome of the collinearity test indicates that there is no excessive correlation between the variables. The multicollinearity assumption asserts that there should not be a perfect linear relationship among the independent variables, as the presence of such a relationship would violate the classical assumption.

Cointegration test

The Johansen Cointegration test assesses the presence of cointegration among variables, examining multiple ranks as potential indicators of cointegration relationships within the system. For each rank, the test provides eigenvalues, trace test statistics, probabilities, likelihood maximum test statistics, and

associated probabilities in Table 3. Upon analysis, the results indicate a robust rejection of the null hypothesis of no cointegration for ranks 0, 1, 2, and 3. These ranks exhibit significant probabilities for both the trace test and the likelihood maximum test, suggesting strong evidence of cointegration up to rank 3. Specifically, for rank 0, the probabilities for both tests are smaller than 1%, indicating at least one cointegrating equation at the chosen significance level. Ranks 1 and 2 similarly demonstrate probabilities lower than 1% for both tests, further supporting the presence of cointegration within the system. Rank 3 also exhibits significant probabilities lower than 1% for both tests, providing additional evidence of cointegration up to this rank. However, for higher ranks (4 and above), the probabilities exceed the chosen significance level, suggesting insufficient evidence to reject the null hypothesis of no cointegration. Based on the Johansen Cointegration test results, there is evidence of cointegration present among the selected variables.

Table 3: Johansen Cointegration test

Rank	Eigenvalue	Trace test	Probability	likelihood maximum test	Probability
0	1.000	1237	0.000	978.46	0.000
1	0.985	258.81	0.000	118.61	0.001
2	0.895	140.20	0.000	63.171	0.000
3	0.800	77.030	0.000	45.130	0.000
4	0.507	31.900	0.027	19.853	0.074
5	0.340	12.047	0.156	11.673	0.124
6	0.013	0.374	0.540	0.374	0.540

Source: Authors calculations

Regression results

The regression results for model equations 1 and 2 are indicated in Tables 4 and 5, with GDP as the dependent variable. The regression analysis in Table 4 reveals the relationship between GDP and various independent variables. The intercept term, representing the predicted GDP when all independent variables are zero, is statistically significant, indicating that even without any explanatory variables, there is a base level of economic activity. Unemployment exerts a negative influence on GDP, implying that higher levels of unemployment are associated with lower GDP levels. External debt shows a positive relationship with GDP, suggesting that countries with higher levels of external debt tend to have higher GDP, potentially indicating investment or spending funded by debt. Trade openness has a positive but statistically insignificant effect on GDP, indicating that while increased trade may contribute to economic growth,

this relationship is not significant within the given model. The real effective exchange rate exhibits a negative relationship with GDP, although it is not statistically significant, implying that changes in the real exchange rate may not have a substantial impact on GDP within the scope of this analysis. Foreign Direct Investment (FDI) has a strong positive impact on GDP, indicating that higher levels of FDI are associated with increased economic output. Inflation negatively affects GDP, suggesting that higher inflation rates are associated with lower GDP levels, possibly due to reduced purchasing power and investment. Overall, the regression model explains a large proportion of the variance in GDP ($R^2 = 0.98$), indicating a good fit, with significant explanatory power provided by the included variables. However, there was no specification problem and autocorrelation of first-order. The normality of the residual shows that the error is normally distributed. The normality test result shows a p-value of 0.16, which is greater than the 5% significance level; hence the null hypothesis is not rejected.

Table 4: Multiple regression estimation

Variable	Coefficient	Std. Error	Test-ratio	probability
Constant	22.294**	8.436	2.643	0.014
Unemployment	−1.129**	0.444	−2.546	0.017
External debt	1.206***	0.111	10.90	0.000
Trade openness	0.079*	0.045	1.759	0.091
Real effective exchange rate	−0.060	0.051	−1.175	0.251
FDI	3.870***	0.573	6.759	0.000
Inflation	−0.111**	0.052	−2.116	0.045
R^2=0.98	R^2 adjusted=0.97	D.W.=1.546		

Significant codes: ***1%, **5%, *10%;

Source: Authors calculations

The regression analysis in Table 5 indicates significant association between GDP and the independent variables considered, with a lag of one period for external debt, FDI, and inflation. The intercept term, representing the predicted GDP when all lagged independent variables are at their previous period's values, is highly statistically significant, suggesting a fundamental base level of economic activity. Unemployment, without a lag, demonstrates a negative association with GDP, indicating that current levels of unemployment correspond to lower GDP levels in the same period. This relationship appears to be statistically significant, indicating its immediate impact on GDP. External debt with a lag of one period exhibits a positive impact on GDP, implying that higher levels

of external debt in the previous period are associated with higher GDP in the current period. Trade openness, without a lag, shows a positive relationship with GDP, suggesting that increased trade in the same period is associated with higher economic output. FDI, with a lag of one period, has a strong positive impact on GDP, indicating that higher levels of foreign direct investment in the previous period correspond to increased economic output in the current period. Inflation, with a lag of one period, negatively affects GDP, suggesting that higher inflation rates in the previous period are associated with lower GDP levels in the current period. Overall, the regression model with lagged variables explains a substantial proportion of the variance in GDP, with the included lagged variables collectively providing a robust explanation of economic output dynamics over time. Additionally, the Durbin-Watson statistic (D.W.) suggests no significant autocorrelation in the residuals.

Table 5: Distributed lagged estimation

Variable	Coefficient	Std. Error	Test-ratio	probability
Constant	17.115***	3.132	5.465	0.000
Unemployment	−1.448***	0.464	−3.122	0.005
External debt_1	1.194***	0.097	12.36	0.000
Trade openness	0.103**	0.042	2.444	0.022
FDI_1	4.732***	0.552	8.576	0.000
Inflation_1	−0.117**	0.052	−2.264	0.032
R^2=0.97	R^2 adjusted=0.97	D.W.=1.674		

Significant codes: ***1%, **5;

Source: Authors calculations

5. DISCUSSIONS

The study investigated the impact of external debt, FDI, real effective exchange rate, unemployment rate, and trade openness on Ghana's economy, utilizing GDP as a proxy. It sought to answer the research question of whether there exists a long and short-run relationship among these variables. The Johansen cointegration test revealed a long-run relationship between the variables toward economic advancement. However, the regression results showed that external debt, FDI, and trade openness significantly and positively affect economic enhancement, whereas unemployment and inflation rates exert a detrimental effect. Trade openness emerged as the main factor influencing growth, consistent with the empirical results of Nketiah et al. (2020). Additionally, Mireku, Agyei

& Domeher (2017) found that changes in trade openness have a favorable impact on the volatility of both long- and short-term economic growth, corroborating the evidence on trade openness. George, James & Poku (2013) identified trade openness and exchange rate as drivers of Ghana's FDI inflows, with Boakye and Gyamfi (2017) further confirming a positive causal relationship between trade openness and economic growth which contradicts our findings. Trade openness remained significant due to the government's implementation of various trade policies supporting imports into the economy. The coefficient of FDI inflows from the regression results demonstrated its significant contribution to Ghana's GDP due to yearly increment inflows over the past decades. The high FDI flow to the country is attributed to government investment policy and incentive implementations under the Ghana Investment Promotion Center formation. The hypothesis that FDI stimulates economic growth was confirmed by the study, supported by empirical findings from Nketsiah & Quaidoo (2017), Evans, Frank & Rebecca (2017), Rahman (2014), and Sokang (2018). However, the Granger causality results revealed a short-term relationship between FDI and GDP, while empirical outcomes from Musah et al. (2018) showed that FDI is positively connected and significant with economic growth in both the short and long run. On the other hand, the distributed lagged models found inflation to hinder growth, in line with the results of Ho and Iyke (2018). The real exchange rate was found not to affect growth based on the study's results, although evidence from cointegration suggested a positive impact on growth. Additionally, external debt was found to positively support growth in Ghana, consistent with a study by Yeboah (2022) The relationship between external debt and economic advancement, which was confirmed in a similar study by Isaac, Tinashe & Mensah (2021). The unemployment rate was identified to harm Ghana's economic growth based on the regression outcome.

5. CONCLUSIONS

This study evaluated the impact of external debt, foreign direct investment, inflation, real effective exchange rate, trade openness, and unemployment rate on economic growth in Ghana, utilizing Gross Domestic Product (GDP) as a proxy. Time series data from the World Bank spanning the period 1991 to 2021 at a yearly frequency were employed. The analysis involved various statistical techniques, including the Johansen cointegration test, ordinary least squares (OLS), and distributed lagged models. The Johansen cointegration test identified a long-run relationship among the variables contributing to economic advancement. The OLS output shows that inflation and unemployment harm

economic growth, whereas external debt, FDI, and trade openness positively stimulate growth. The distributed lagged model with one period lags of FDI, external debt, and inflation proves that their impacts are distributed over some periods, and it further revealed their variables' impact expands yearly. The study outcomes concluded that FDI, external debt, and trade openness positively impact economic growth if managed well, confirming that hypotheses stimulate growth. The findings from the OLS regression and distributed lagged model offer several detailed policy implications for Ghana. Firstly, in the context of the Ghanaian economy, addressing inflation and unemployment is imperative due to their negative impacts on economic growth. Policy measures should prioritize controlling inflation rates and implementing strategies to reduce unemployment through monetary policies focusing on price stability and fiscal policies targeting job creation through investments in infrastructure, education, and skills development programs. Secondly, effective management of external debt is crucial for sustaining economic growth in Ghana. While external borrowing can positively influence growth, policies should ensure prudent utilization of borrowed funds for productive investments in infrastructure development and human capital enhancement. Diversifying funding sources and reducing reliance on external borrowing could enhance financial stability in the long run. Thirdly, given the significant contribution of FDI to Ghana's economic growth, policies should aim to attract and retain foreign investors by creating a conducive business environment, improving infrastructure, enhancing regulatory frameworks, and providing investment incentives. Strengthening institutions responsible for investment promotion and facilitation could further encourage FDI inflows. Fourthly, promoting trade openness is essential for stimulating economic growth in Ghana. Policy efforts should continue to focus on trade liberalization, reducing trade barriers, and promoting export-oriented industries through trade agreements, trade facilitation measures, and investments in trade-related infrastructure.

The distributed lagged model emphasizes the importance of considering the long-term impact of policy interventions. Policy frameworks should prioritize stability and consistency to foster sustained economic growth, supported by long-term development plans with clear objectives and monitoring mechanisms. Investing in human capital development is critical for enhancing productivity and competitiveness in the Ghanaian economy. Policies aimed at improving access to quality education and healthcare services, promoting vocational training, and supporting entrepreneurship can help develop a skilled workforce and drive innovation and technological advancement. To ensure equitable and sustainable development outcomes, policy interventions should be designed to address

income inequality, promote social inclusion, and mitigate regional disparities. By implementing inclusive growth strategies, Ghana can ensure that the benefits of economic growth are widely shared across society, fostering a more resilient and prosperous economy.

Conflict of interests

The authors declare there is no conflict of interest.

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ДА ЛИ МАКРОЕКОНОМСКИ ФАКТОРИ ЗНАЧАЈНО УТИЧУ НА ЕКОНОМСКИ РАСТ? ДОКАЗИ ИЗ ГАНЕ

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САЖЕТАК

Макроекономија испитује цјелокупну економију користећи различите индикаторе као што су инвестиције, девизни курс, стопа незапослености и трговина. Ови индикатори доприносе или позитивно или негативно привредном расту. Након економских реформи у Гани 1983. године, њена привреда је претрпела значајне трансформације, утичући на њу на различите начине. Ова студија је истраживала одабране макроекономске варијабле (спољни дуг, стране директне инвестиције, инфлацију, стварни ефективни курс и отвореност трговине) које утичу на привредни раст Гане. Студија је анализирала податке временских серија Свјетске банке у периоду од 1991. до 2021. коришћењем економетријских метода, укључујући Јохансенову коинтеграцију, обичне најмање квадрате (ОЛС) и дистрибуирани модел са кашњењем. Резултати коинтеграције открили су дугорочну везу између варијабли. Налази ОЛС-а су показали да су спољни дуг, стране директне

инвестиције и отвореност трговине позитивно утицали на привредни раст, док су инфлација и стопе незапослености имале негативне ефекте, при чему је бруто домаћи производ (БДП) служио као показатељ привредног раста. Поред тога, резултати су показали да реални девизни курс није имао значајан утицај на економију Гане. Насупрот томе, налази из дистрибуираног модела са кашњењем пружили су доказ да се утицај инфлације, спољног дуга и страних диектних инвестиција проширио током одређеног периода. На основу ових налаза, студија препоручује да влада Гане инвестира спољне зајмове у секторе који могу да подстакну економски раст и да обезбеде подстицаје за улагања како би привукли више инвеститора.

Кључне ријечи: *спољни дуг, стране директне инвестиције, бруто домаћи проузвод, отвореност трговине, привредни раст*